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October 2024

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Michael D. Ozner, MD, FACC • Xiaoxi Wei, PhD • Jonathan V. Wright, MD

Contributors

Jason Allen • Gregory E. Bigford, PhD, MSBA • David A. Jernigan, DNM, D.C.
Heather L. Makar • Laurie Mathena • Julia Remington

Advertising

Chief Marketing Officer • Rey Searles • rsearles@lifeextension.com
National Advertising Manager • JT Hroncich • 404-347-4170

Senior Director of Sales and Business Development

Carolyn Bouchard • cbouchard@lifeextension.com • 954-202-7685

Circulation & Distribution

Life Extension • 3600 West Commercial Blvd., Ft. Lauderdale, FL 33309
Editorial offices: 954-766-8433 • fax: 954-491-5306

Customer Service: 800-678-8989 • Email: customerservice@LifeExtension.com

Wellness specialists: 800-226-2370 • Email: wellness@LifeExtension.com

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Mark S. Bezzek, MD, FACP, FAARM, FAAEM, is board-certified in internal medicine, emergency medicine, and anti-aging/regenerative medicine. He holds U.S. patents for a multivitamin/mineral supplement, an Alzheimer's/dementia compilation, and a diabetic regimen.

William Davis, MD, is a preventive cardiologist and author of *Wheat Belly: Lose the Wheat, Lose the Weight* and *Find Your Path Back to Health*.

Thomas F. Crais, MD, FACS, a board-certified plastic surgeon, was medical director of the microsurgical research and training lab at Southern Baptist Hospital in New Orleans, LA, and currently practices in Sun Valley, ID.

Martin Dayton, MD, DO, practices at the Sunny Isles Medical Center in North Miami Beach, FL. His focus is on nutrition, aging, chelation therapy, holistic medicine, and oxidative medicine.

John DeLuca, MD, DC, is a 2005 graduate of St. George's University School of Medicine. He completed his internal medicine residency at Monmouth Medical Center in Long Branch, NJ, in 2008 and is board-certified by the American Board of Internal Medicine. Dr. DeLuca is a Diplomate of the American Academy of Anti-Aging Medicine and has obtained certifications in hyperbaric medicine, pain management, nutrition, strength and conditioning, and manipulation under anesthesia.

Sergey A. Dzigan, MD, PhD, was formerly chief of cardiovascular surgery at the Donetsk Regional Medical Center in Donetsk, Ukraine. Dr. Dzigan's current primary interests are anti-aging and biological therapy for cancer, cholesterol, and hormonal disorders.

Patrick M. Fratellone, MD, RH, is the founder and executive medical director of Fratellone Associates. He completed his internal medicine and cardiology fellowship at Lenox Hill Hospital in 1994, before becoming the medical director for the Atkins Center for Complementary Medicine.

Mitchell J. Ghen, DO, PhD, holds a doctorate in holistic health and anti-aging and serves on the faculty of medicine at the Benemerita Universidad Autonoma De Puebla, Mexico, as a professor of cellular hematopoietic studies.

Gary Goldfaden, MD, is a clinical dermatologist and a lifetime member of the American Academy of Dermatology. He is the founder of Academy Dermatology of Hollywood, FL, and COSMESIS Skin Care.

Miguelangelo Gonzalez, MD, is a certified plastic and reconstructive surgeon at the Miguelangelo Plastic Surgery Clinic, Cabo San Lucas.

Roberto Marasi, MD, is a psychiatrist in Brescia and in Piacenza, Italy. He is involved in anti-aging strategies and weight management.

Maurice D. Marholin, DC, DO, is a licensed chiropractic physician and board-certified osteopathic family physician. While training at the University of Alabama, he completed fellowships in Clinical Nutrition and Behavioral Medicine. He is currently in private practice in Clermont, FL.

Professor Francesco Marotta, MD, PhD, of Montenaepolone Medical Center, Milan, Italy, is a gastroenterologist and nutrigenomics expert with extensive international university experience. He is also a consulting professor at the WHO-affiliated Center for Biotech & Traditional Medicine, University of Milano, Italy and honorary resident professor, Nutrition, Texas Women's University. He is the author of more than 130 papers and 400 lectures.

Philip Lee Miller, MD, is founder and medical director of the Los Gatos Longevity Institute in Los Gatos, CA.

Michele G. Morrow, DO, FAAFP, is a board-certified family physician who merges mainstream and alternative medicine using functional medicine concepts, nutrition, and natural approaches.

Filippo Ongaro, MD, is board-certified in anti-aging medicine and has worked for many years as flight surgeon at the European Space Agency. He is a pioneer in functional and anti-aging medicine in Italy where he also works as a journalist and a writer.

Lambert Titus K. Parker, MD, an internist and a board-certified anti-aging physician, practices integrative medicine from a human ecology perspective with emphasis on personalized brain health, biomarkers, genomics and total health optimization. He serves as the Medical Director of Integrative Longevity Institute of Virginia, a 501(c)3 Non-Profit Medical Research Institute. He also collaborates on education and research for Hampton Roads Hyperbaric Therapy.

Ross Pelton, RPh, PhD, CCN, is scientific director for Essential Formulas, Inc.

Patrick Quillin, PhD, RD, CNS, is a clinical nutritionist in Carlsbad, CA, and formerly served as vice president of nutrition for Cancer Treatment Centers of America, where he was a consultant to the National Institutes of Health.

Michael R. Rose, MD, a board-certified ophthalmologist with the Rose Eye Medical Group in Los Angeles, CA, is on the staff of the University of Southern California and UCLA.

Ron Rothenberg, MD, is a full clinical professor at the University of California San Diego School of Medicine and founder of California HealthSpan Institute in San Diego.

Roman Rozencwaig, MD, is a pioneer in research on melatonin and aging. He practices in Montreal, Canada, as research associate at Montreal General Hospital, Department of Medicine, McGill University.

Michael D. Seidman, MD, FACS, is the director of skull base surgery and wellness for the Adventist Health System in Celebration, FL.

Ronald L. Shuler, BS, DDS, CCN, LN, is involved in immunoncology for the prevention and treatment of cancer, human growth hormone secretagogues, and osteoporosis.



Sandra C. Kaufmann, MD, is a fellowship-trained and board-certified pediatric anesthesiologist as well as the Chief of Anesthesia at the Joe DiMaggio Children's Hospital in Hollywood, Florida. She is the founder of The Kaufmann Anti-Aging Institute and the author of the book *The Kaufmann Protocol: Why we Age and How to Stop it* (2018). Her expertise is in the practical application of anti-aging research.



Richard Black, DO, is a dedicated nuclear medicine physician practicing as an independent contractor out of Cleveland, Ohio. Dr. Black is board-certified in internal medicine and nuclear medicine, and is licensed to practice medicine in multiple states throughout the United States.



Aubrey de Grey, PhD, is a biomedical gerontologist and Editor-in-Chief of *Rejuvenation Research*, the world's highest-impact, peer-reviewed journal focused on intervention in aging. He received his BA and PhD from the University of Cambridge in 1985 and 2000 respectively. Dr. de Grey is a Fellow of both the Gerontological Society of America and the American Aging Association and sits on the editorial and scientific advisory boards of numerous journals and organizations.



Deborah F. Harding, MD, is founder of the Harding Anti-Aging Center. She is double board-certified in internal medicine and sleep disorder medicine. She also earned the Cenegenics certification in age management medicine. She is a faculty member of the University of Central Florida Medical School.



Joel Kahn, MD, FACC of Detroit, Michigan, is a practicing cardiologist, and a Clinical Professor of Medicine at Wayne State University School of Medicine. He graduated Summa Cum Laude from the University of Michigan Medical School. Known as "America's Healthy Heart Doc", Dr. Kahn has triple board certification in Internal Medicine, Cardiovascular Medicine and Interventional Cardiology. He was the first physician in the world to certify in Metabolic Cardiology with A4M/MMI and the University of South Florida. He founded the Kahn Center for Cardiac Longevity in Bingham Farms, MI.



Peter H. Langsjoen, MD, FACC, is distinguished by a long career in cardiology with a specialization in congestive heart failure, primary and statin-induced diastolic dysfunction and other heart diseases. He is a leading authority on coenzyme Q10, having been involved with its clinical application since 1983. He is a founding and executive committee member of the International Coenzyme Q10 Association, a fellow of the American College of Cardiology and a member of numerous other medical associations.



Dipnarine Maharaj MD, MB, ChB, FRCP (Glasgow), FRCP (Edinburgh), FRCPath., FACP, is the Medical Director of the Maharaj Institute of Immune Regenerative Medicine, and is regarded as one of the world's foremost experts on adult stem cells. He received his medical degree in 1978 from the University of Glasgow Medical School, Scotland. He completed his internship and residency in Internal Medicine and Hematology at the University's Royal Infirmary.



L. Ray Matthews, MD, FACS, is a professor of surgery and director of Surgical Critical Care at Morehouse School of Medicine in Atlanta, GA, and a trauma and critical care surgeon at Grady Memorial Hospital. He has published widely and is known as one of the top vitamin D experts. Dr. Matthews has spoken before the U.S. Food and Drug Administration several times, presenting a recent update about clinical research on vitamin D.



Ralph W. Moss, PhD, is the author of books such as *Antioxidants Against Cancer*, *Cancer Therapy*, *Questioning Chemotherapy*, and *The Cancer Industry*, as well as the award-winning PBS documentary *The Cancer War*. Dr. Moss has independently evaluated the claims of various cancer treatments and currently directs The Moss Reports, an updated library of detailed reports on more than 200 varieties of cancer diagnoses.



Michael D. Ozner, MD, FACC, FAHA, is a board-certified cardiologist who specializes in cardiovascular disease prevention. He serves as medical director for the Cardiovascular Prevention Institute of South Florida and is a noted national speaker on heart disease prevention. Dr. Ozner is also author of *Heart Attacks Are Not Worth Dying For*, *The Great American Heart Hoax*, and *The Complete Mediterranean Diet*. For more information visit www.DrOzner.com.



Jonathan V. Wright, MD, is medical director of the Tahoma Clinic in Tukwila, WA. He received his MD from the University of Michigan and has taught natural biochemical medical treatments since 1983. Dr. Wright pioneered the use of bioidentical estrogens and DHEA in daily medical practice. He has authored or co-authored 14 books, selling more than 1.5 million copies.



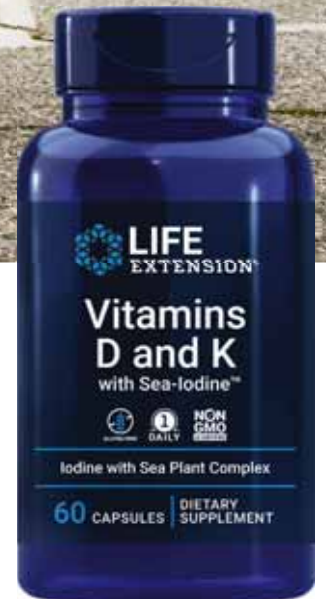
Xiaoxi Wei, PhD, is a chemist, expert in supramolecular assembly and development of synthetic transmembrane nanopores with distinguished selectivity via biomimetic nanoscience. She has expertise in ion channel function and characterization. She founded X-Therma Inc., a company developing a radical new highway towards non-toxic, hyper-effective antifreeze agents to fight unwanted ice formation in regenerative medicine and reduce mechanical icing.



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Deadly Impact of Early Menopause



WILLIAM FALOON



Menopause can be defined as the point when the ovaries do not adequately produce **hormones**, and a woman stops having menstrual periods for 12 months consecutively.

Early-onset menopause (between 40-45 years) is associated with an increase in risk of cardiovascular disease, psychiatric disorders, osteoporosis, and overall mortality.¹⁻⁴

One study observed women who had their last period before **age 45** compared to those who entered menopause at **age 45** or **older**. *Earlier* menopause was associated with about a **50% higher risk of coronary heart disease**.⁵

A separate study observed significant increases in **cardiovascular disease** and **overall mortality** correlated with more **severe** menopausal miseries. Serious health risks were also associated with the **severity** of specific **menopausal** disorders.⁶

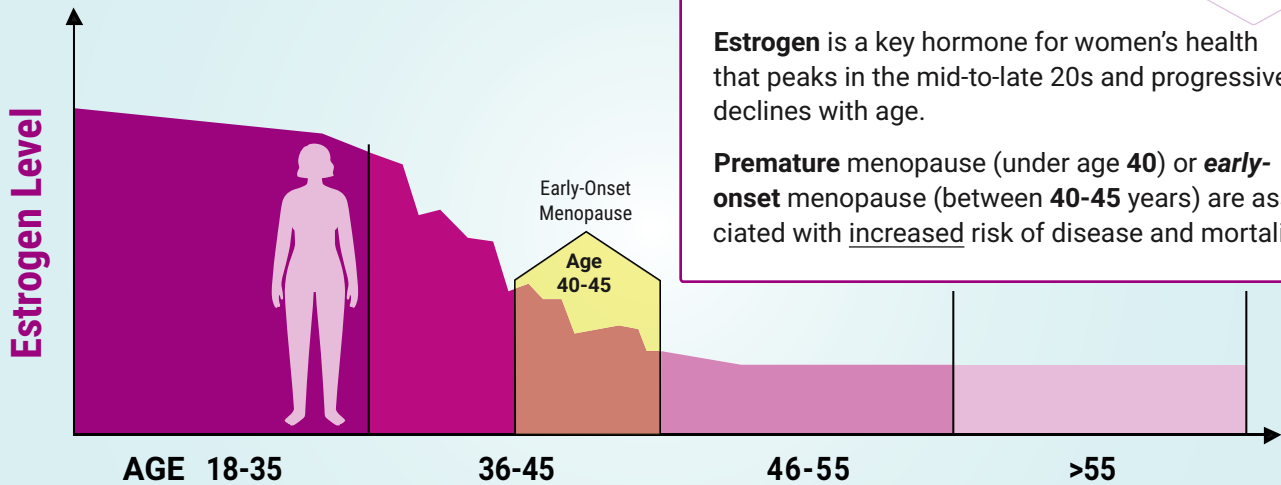
As it relates to **longevity**, another observational study that assessed correlation found that **life expectancy** was **2.0 years longer** in women with menopause after **age 55** compared to those with menopause prior to **age 40**.²

Scientists are working to develop methods to **delay** reproductive **aging**, thus enabling **older women** to conceive children, postpone or avoid menopausal miseries, and possibly **live longer**.

In the meantime, those facing adverse effects of **hormone** depletion have options to alleviate **menopausal** miseries.



Age-Related Decline of Estrogen Levels



Estrogen is a key hormone for women’s health that peaks in the mid-to-late 20s and progressively declines with age.

Premature menopause (under age 40) or **early-onset** menopause (between 40-45 years) are associated with increased risk of disease and mortality.

Although this has not yet been demonstrated in randomized clinical trials, perhaps judicious replacement of sex **hormones** might attenuate some of the possible **lifespan-shortening** impact associated with **early-onset** and/or **severe** menopause.

Page 30 describes **plant-derived** estrogens that boosted **estradiol** blood levels and reduced **menopausal** symptoms in a placebo-controlled **clinical trial**.

The article on page 50 of this month’s issue reveals startling details about the impact of **early menopause** reported in the published scientific literature.

For longer life,

William Faloon, Co-Founder
Life Extension

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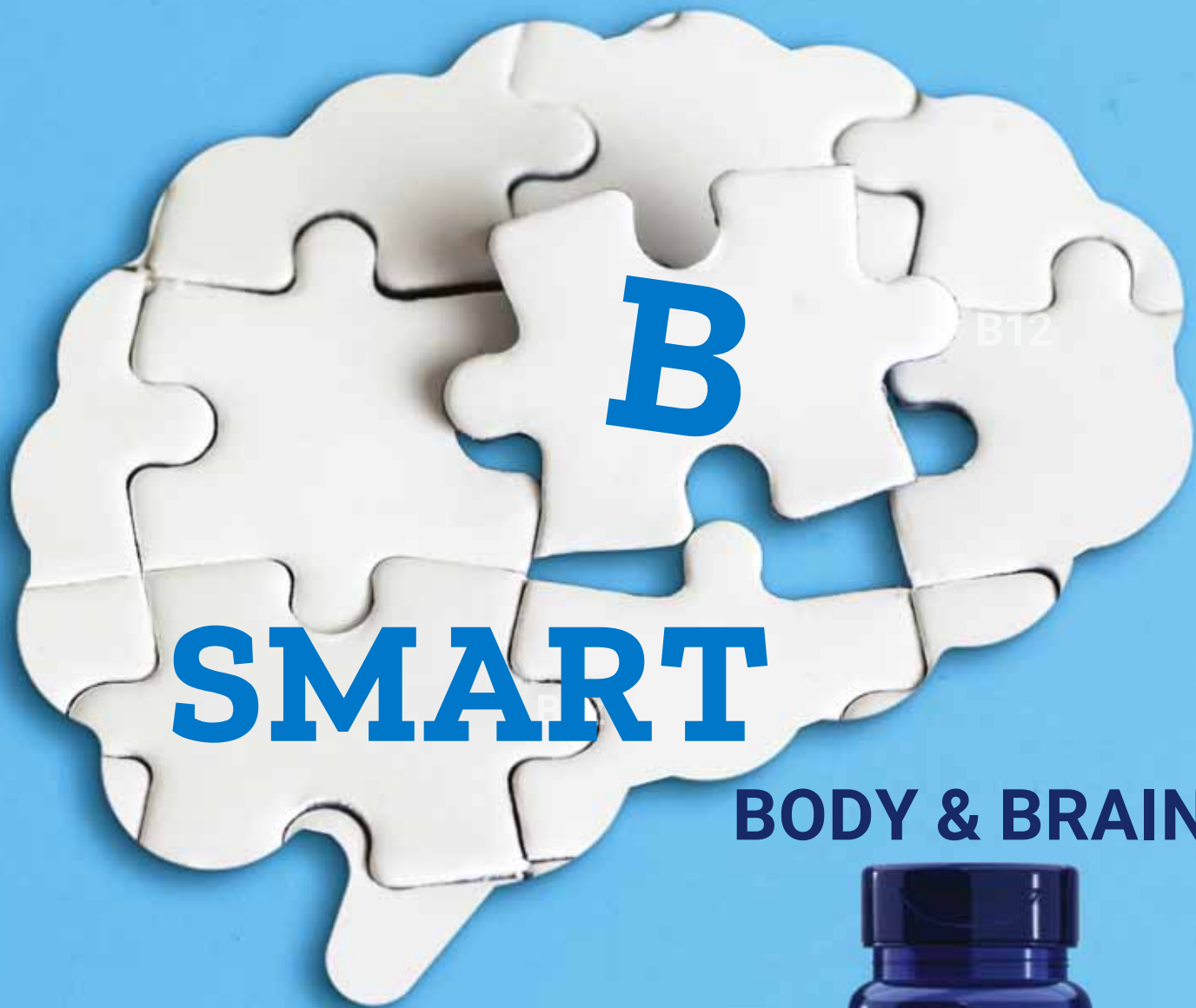
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Life Extension Clinical Research, Inc. is a dedicated research arm of Life Extension. Our research efforts are primarily focused on understanding the potential benefits of innovative dietary supplements and healthy lifestyle regimens on longevity, healthspan and quality of life.

We also offer Contract Research Organization (CRO) services, helping others develop and implement their own clinical trials—from subject recruitment to project management.



How to Participate

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Our Published Studies

Inflammation and Discomfort: This virtually conducted study on inflammation and discomfort found that a PRM-enriched marine oil/ bioavailable curcumin combo significantly reduced pain severity, intensity, and total pain scores over the course of 60 days.

Men's Bladder Clinical Study: Focusing on the quality-of-life effects of nighttime urinary frequency, this study showed promise for men seeking non-pharmaceutical therapies for frequent, sleep-disrupting nighttime urination.

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Life Extension Clinical Research, Inc.

In the News



Diet for Healthy Aging

Consuming a healthy diet from one's 40s through the age of 70 was connected to healthy aging, a recent study found.*

The investigation included 36,464 men enrolled in the Health Professionals Follow-Up Study and 70,467 women who participated in the Nurses' Health Study.

Responses to questionnaires completed every four years were analyzed for adherence to eight healthy dietary patterns:

- Alternative healthy eating index,
- Alternative Mediterranean diet,
- Dietary approaches to stop hypertension (DASH),
- Mediterranean-DASH intervention for neurodegenerative delay diet (MIND),
- Healthful plant-based diet,
- Planetary health diet,
- Empirical dietary index for hyperinsulinemia, and
- The empirical dietary inflammatory pattern.

During 30 years of follow-up, 9,837 participants achieved healthy aging. "The people who had healthier eating patterns had a **43%** to **84%** greater chance of aging well compared with those who did not," the authors stated.

Editor's Note: "Overall, the more fruits, vegetables, unsaturated fats, nuts, low-fat dairy and whole grains people ate, the better they were in terms of aging. Participants with diets made mostly of trans fats, sodium, as well as red and processed meats, had lower odds of healthy aging," the study's authors concluded.

* *J.CDNut*.10.1016 2024.102176.

Athletes Benefit from Vitamin D Supplementation

A systematic review concluded that there are several benefits from supplementing with vitamin D for elite male and female athletes.*

Researchers evaluated data from 14 randomized trials that examined the effects of vitamin D3 capsules or drops among 482 athletes. Vitamin D doses ranged from **2,000 IU** to around **7,100 IU** per day, with an average daily dose of around **5,000 IU/day**, administered for at least two weeks.

Of three studies that evaluated aerobic capacity, two found improvements in maximal oxygen uptake and physical working capacity in association with vitamin D.

Five of the seven studies that evaluated anaerobic power and strength resulted in vitamin D-associated improvements.

Among four studies that evaluated bone health, one demonstrated increased bone mineral density in association with vitamin D compared with the control group.

Editor's Note: "Deficiency in vitamin D has been shown to increase the risk of injury," the researchers stated.

* *Orthop J Sports Med.* 2024 Jan 3;12(1):23259671231220371.





Ginkgo Benefits Stroke Patients

Acute ischemic stroke patients who received ginkgo in addition to conventional treatment showed improved cognitive function, a clinical trial found.*

Of the 126 participants, 63 received **25 mg** ginkgo daily for two weeks in addition to conventional care while the other patients received conventional care alone. Inflammatory and blood coagulation factors were measured before, and two weeks after the treatment period. Cognitive function tests were administered prior to the trial and at three and six months after the trial's conclusion.

In both groups, cognitive and neurological functions were assessed at baseline, day 14 and after three months of treatment. Neurological functions' deficits assessed by National Institutes of Health Stroke Scale scores improved after 14 days and continued to show improvement after three months in the ginkgo group as compared to placebo.

Activities of daily living scores in the treatment group improved at day 14 and for three months after treatment compared to placebo.

Editor's Note: In addition, before treatment inflammatory and coagulation factors were similar in both groups of participants, but after 14 days they were lower among treated patients than the controls.

* *Open Med (Wars)*. 2024 Mar 13;19(1):20240908.

Cranberry Extract Supports a Healthy Microbiome

An increase in beneficial *Bifidobacterium* and other favorable microbial changes were found in people who supplemented short-term with cranberry extract, according to a recent study.* Cranberry is rich in various polyphenol compounds, including anthocyanins and flavonols.

The study included 28 men and women who were asked to refrain from foods that contained cranberry flavanols for a week. They were subsequently assigned to four days during which they consumed cranberry extract capsules twice per day. Stool samples were collected before and after the treatment period.

At the time of the study's conclusion, *Bifidobacteria* and butyrate-producing bacteria in stool samples were increased compared with samples obtained prior to the administration of cranberry extract.

Editor's Note: Improvement in the composition of the gut microbiome can help protect against unfavorable effects of a Western diet, the authors stated.

* *NPJ Biofilms Microbiomes*. 2024 Mar 6;10(1):18.



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[†] 3-O-acetyl-11-keto-B-boswellic acid.

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Banish Bloat and **INDIGESTION**





BY GREGORY E. BIGFORD, PHD, MSBA

A large survey found that nearly one in seven Americans has experienced feelings of trapped gas in the gut, excessive fullness, abdominal pressure, and pain.¹

Bloating is often associated with other gut disorders such as **dyspepsia** (indigestion), celiac disease, and constipation.¹

Over-the-counter and prescription medications don't always help, and all too often provide only minor relief.

Four plant-based compounds have been shown to ease bloating and occasional digestive discomfort.

In a clinical trial, a combination of **fennel** and **curcumin** relieved symptoms of irritable bowel syndrome by **50%** compared to baseline and stopped *all* symptoms in **26%** of users after 30 days.²

In another trial, **63%** of those taking an **artichoke-ginger** blend had significant reductions in bloating, nausea, abdominal pain, and other symptoms of indigestion after four weeks.³



Fennel-Curcumin Relieves Bloating and Pain

Seeds of the **fennel** plant, known for its licorice flavor, have long been consumed after meals to promote digestion and prevent gas.⁴

Fennel seed oil has antimicrobial, antifungal, anti-inflammatory, and antispasmodic (relieving involuntary muscle spasm) properties.^{2,4,5} These actions may help get rid of bacteria that can cause gassiness and help encourage healthy gastrointestinal muscle activity to relieve bloating.

Curcumin, a compound found in the spice turmeric, promotes the gall bladder to release bile into the intestines to help in the management of bile flow and aid digestion.⁶⁻⁸ Curcumin's anti-inflammatory properties^{9,10} may further relieve digestive symptoms by lowering gut **inflammation**.^{11,12}

In a randomized controlled clinical trial, researchers treated adults with **irritable bowel syndrome** with a twice-daily combination of **25 mg** of **fennel seed oil** and a low **42 mg** dose of **curcumin**.²

After 30 days, those who took the fennel-curcumin blend had a **48%** average reduction in irritable bowel syndrome symptoms, including **bloating** and **abdominal pain**. That was nearly *double* the decrease seen in a placebo group.



Even more remarkable, **26%** of those taking fennel-curcumin were **completely symptom-free** after 30 days, compared to close to **7%** of placebo recipients.²

The treated group reported a significant enhancement in **quality of life**, and no adverse effects.

Artichoke-Ginger Eases Indigestion

Artichoke improves gut **motility** and increases **bile** production, which speeds up digestion and aids in fat breakdown and vitamin absorption.^{13,14}

In a clinical trial, artichoke extract significantly alleviated symptoms of **functional dyspepsia** (recurring and unexplained indigestion), including fullness, gassiness, and bloating.¹⁵

Ginger may help relieve gastrointestinal disorders by reducing oxidative stress and inflammation in the digestive tract.^{16,17} Ginger also enhances digestive function by promoting **gastric motility**.¹⁸

In another randomized controlled trial, scientists gave adults with functional dyspepsia a twice daily combination of **20 mg** of **ginger root extract** and **100 mg** of **artichoke leaf extract**. After four weeks, **63%** of those who received this combination had a marked reduction in digestive symptoms, including bloating, fullness, nausea, and upper abdominal pain, compared to just **25%** of those in the placebo group.³

WHAT
YOU
NEED
TO
KNOW



An additional study confirmed that an **artichoke-ginger** blend promotes **gastric emptying**, the movement of food from the stomach to the small intestine, which can relieve indigestion and nausea.¹⁹

Summary

Post-meal **bloating** can make people miserable and have a serious impact on quality of life.

The plant compounds **fennel**, **curcumin**, **artichoke**, and **ginger** have clinically demonstrated effectiveness in reducing symptoms like bloating, gas, nausea, and abdominal pain.

In clinical studies, a **fennel-curcumin** combination reduced **irritable bowel syndrome** symptoms by **50%** compared to baseline and stopped them entirely in **26%** of users at 30 days. An artichoke-ginger blend reduced digestive symptoms including bloating, nausea, and abdominal pain in **63%** of those taking it.

A combination of all **four** compounds may maximize relief for bloating and other gastrointestinal problems. ●

If you have any questions on the scientific content of this article, please call a **Life Extension** Wellness Specialist at 1-866-864-3027.

Relief for Uncomfortable Bloating

- Post-meal **bloating**, the feeling of excessive fullness, abdominal pressure and pain, and gassiness, was found, in one large study, to have affected nearly **one in seven** Americans in the seven days before the survey.
- **Fennel, curcumin, artichoke, and ginger** help relieve bloating and digestive issues.
- In a clinical study, a **fennel seed oil-curcumin** combination led to a **50%** reduction in IBS symptoms compared to baseline, including bloating and abdominal pain, and a **complete** end to all symptoms in **26%** of users after 30 days.
- Another clinical study shows that a blend of **ginger root** and **artichoke leaf** extracts relieved symptoms of indigestion, including bloating, fullness, nausea, and upper abdominal pain in **63%** of those who received the extracts after four weeks.

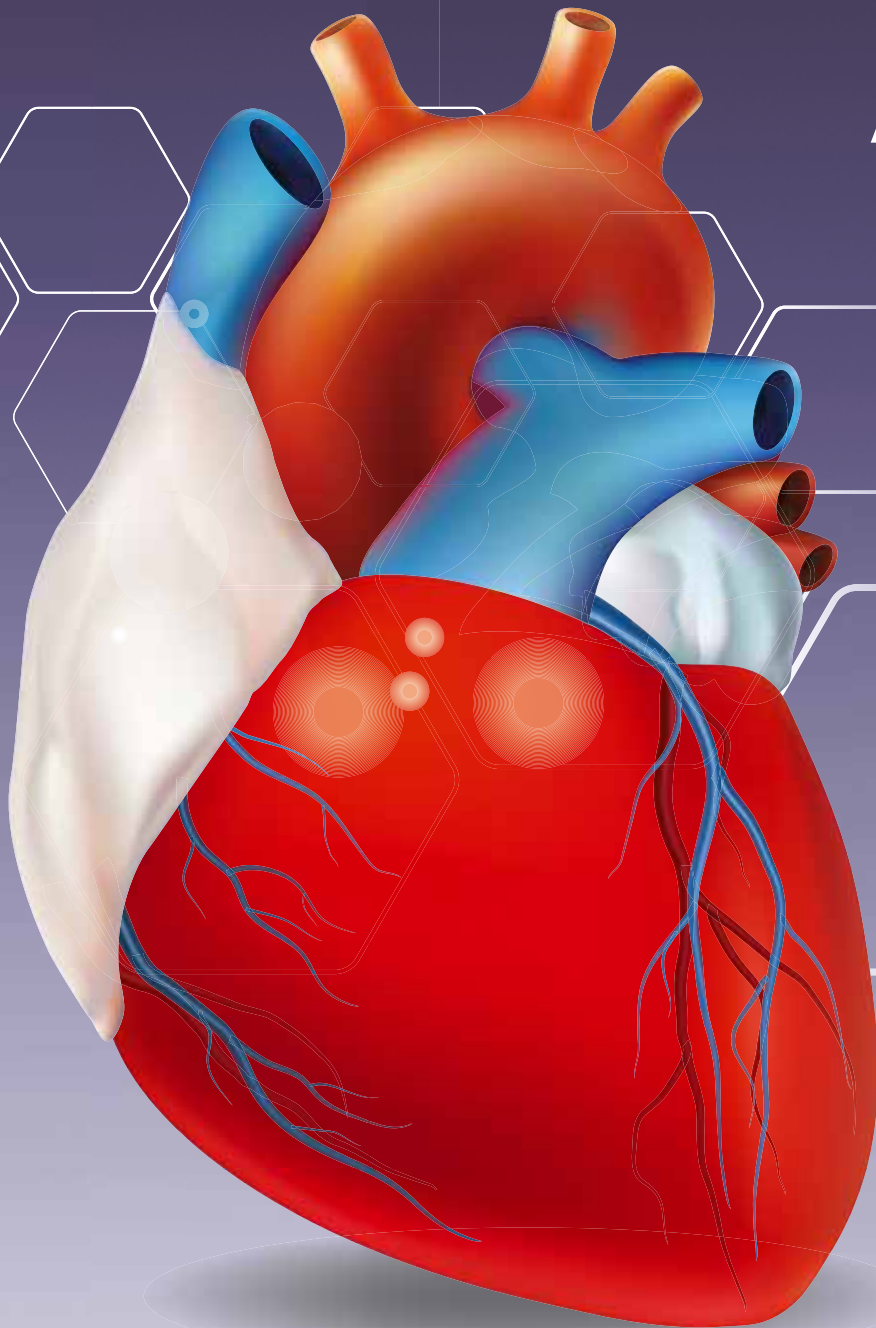
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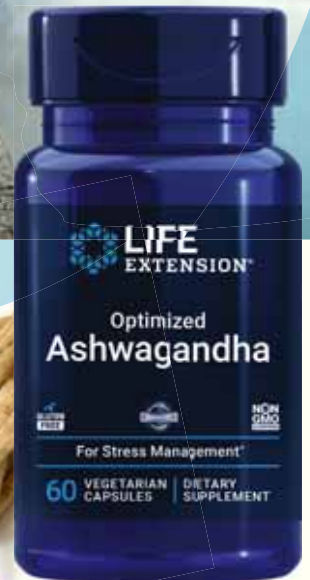
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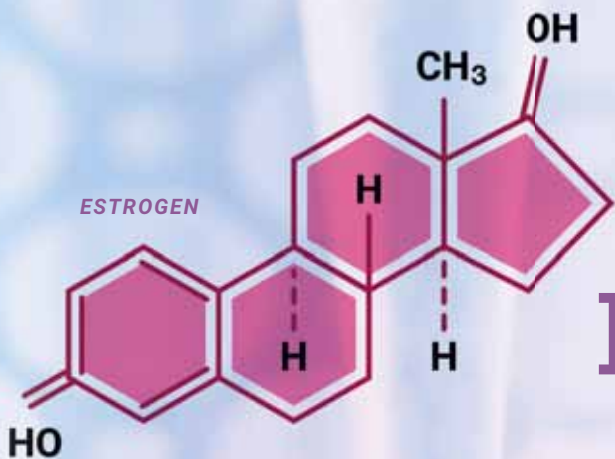
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FENUGREEK





Restore HORMONAL BALANCE in Menopause

BY HEATHER L. MAKAR

For centuries, the herb **fenugreek** has been used in traditional medicine to promote **hormonal balance** and ease the symptoms of **menopause**.

Modern science has confirmed these benefits.

In multiple **clinical trials**,¹⁻⁵ a standardized **fenugreek seed extract** was shown to support healthy **estrogen** levels and ease the most common discomforts of **menopause**.

In one study, fenugreek extract reduced:³

- Hot flashes by **35%**,
- Night sweats by **25%**,
- Depressive mood by **43%**,
- Sleep problems by **30%**,
- Vaginal dryness by **11%**, and
- Leg joint and muscle discomfort by **37%**.

This article describes clinical data supporting these impressive findings.



How Menopause Harms Health

Menopause officially starts when a woman has gone 12 months without menstruating.

Symptoms usually begin when a woman is in her 40s as a result of reduced production of the hormones **estrogen** and **progesterone**.

Worldwide, about **57%** of women experience unpleasant menopausal symptoms such as **night sweats** and **hot flashes**.⁶

Declining estrogen can also lead to **psychological symptoms** like mood swings, anxiety, and **depression**, along with **vaginal dryness** and discomfort that makes intimacy painful.⁷

Low estrogen levels can also adversely affect women's **long-term health**.

For example, loss of estrogen contributes to **brain aging**, slowing synaptic connections in the brain and impairing neuroplasticity. This makes it difficult for women to learn new things and to recall skills and memories formed earlier in life.^{8,9}

Estrogen has a protective effect on **cardiovascular health** by maintaining the flexibility of blood vessels, reducing inflammation, and regulating cholesterol levels.

During menopause, the decline in estrogen can lead to loss of blood vessel elasticity, plaque development, and increased inflammation, increasing risk of **cardiovascular disease**.^{10,11}

Raising estrogen levels can help reduce these risks and ease symptoms of menopause.

How Fenugreek Helps

The herb **fenugreek** has long been used in Indian Ayurvedic and Persian traditional medicine to relieve menstrual cramps, enhance libido, and alleviate menopausal symptoms.^{4,12}

In **India**, fenugreek is consumed throughout a woman's life cycle, from adolescence to post-menopause. Fenugreek tea is used during puberty to ease menstrual cramps and following childbirth to promote lactation and uterine recovery.¹²

As women enter **perimenopause** and **menopause**, research shows that fenugreek can help them achieve hormonal balance and reduce the risk of conditions associated with low estrogen.

Fenugreek's bioactive compounds (**protodioscin** and **trigonelline**) help correct hormonal imbalance in two separate ways:

- Promoting production of **estrogen** and other sex hormones. The compound **protodioscin** is converted in the body to the hormone DHEA, a precursor of estrogen and other sex hormones. This enhances the body's production of hormones lost to menopause.¹³
- Providing **phytoestrogens**, plant compounds similar to estrogen. **Trigonelline** is a plant hormone that can bind to estrogen receptors on cells, mimicking the effects of estrogen to help offset the estrogen decline during menopause.¹⁴



A standardized extract of **fenugreek** containing **10% protodioscin** and **3% trigonelline** has demonstrated benefits for **menopause** symptoms in **clinical trials**.³

This standardized fenugreek extract is not the same as fenugreek **seed fiber** used to increase the **bio-availability** of certain nutrients into the bloodstream.^{15,16}

Effects In Human Trials

Several randomized, placebo-controlled trials have confirmed the ability of **fenugreek** to relieve **menopause symptoms** and restore healthy **hormone balance**.¹⁻⁵

In one study, **postmenopausal** women aged 45-58 years old receiving **500 mg of fenugreek seed extract** daily for 42 days had beneficial boosts in **hormones** compared to baseline, including:³

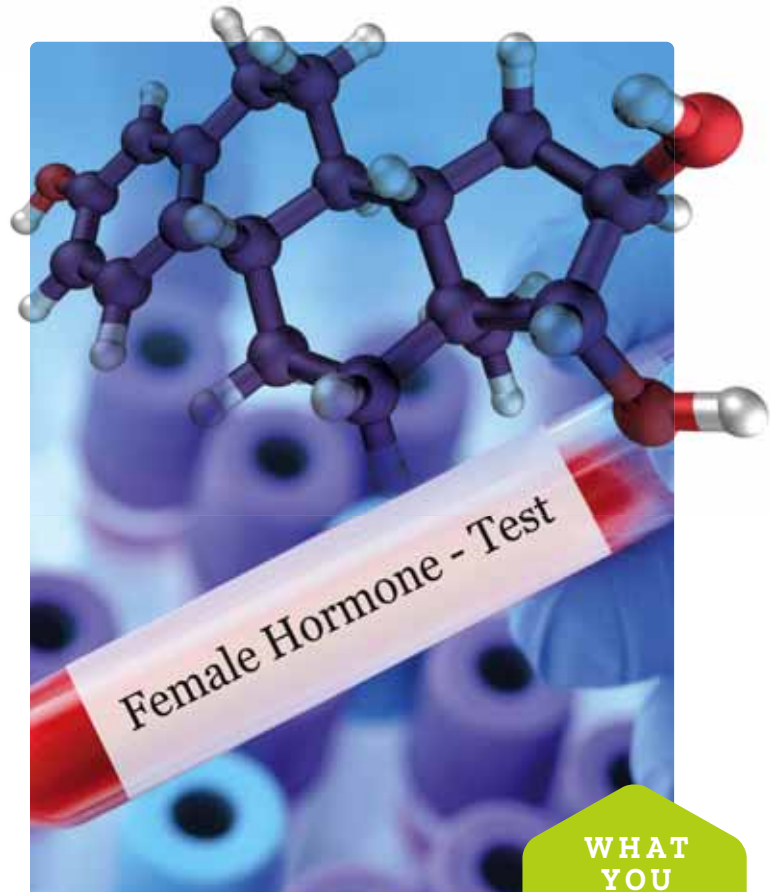
- A **31.6%** increase in **estradiol**, the active form of **estrogen** that binds to receptors and has the strongest effect throughout the body.
- A beneficial **20.4%** decline in **follicle-stimulating hormone (FSH)**. Elevated FSH is a hallmark of menopause that results from **estrogen deficiency**.³

These hormonal improvements translated into symptom relief. Compared to baseline, women reported a striking **35.5%** total score reduction on the **Menopause Rating Scale (MRS)**, a clinically validated questionnaire used to measure severity of menopause symptoms.

Compared to placebo, among the other benefits in the treatment group were:³

- Hot flashes decreased by **35%**,
- Night sweats declined by **25%**,
- Depressive mood improved by **43%**,
- Sleep problems were reduced by **30%**,
- Vaginal dryness lessened by **11%**, and
- Leg joint and muscle discomfort decreased by **37%**.

The decrease in total MRS score greatly surpassed the threshold for clinically meaningful change, emphasizing the effectiveness of the fenugreek extract.³



WHAT
YOU
NEED
TO
KNOW

Boosting Estrogen for Better Health

- As women go through **menopause**, hormonal changes can trigger unpleasant physical and emotional symptoms. In addition, the drop in estrogen poses risks to cognitive and cardiovascular health.
- A standardized **fenugreek seed extract** has been clinically shown to increase active estrogen levels, restoring a healthy hormonal balance.
- Clinical trials show that this fenugreek extract significantly reduces **menopause symptoms**, including hot flashes, night sweats, depressive mood, sleep problems, vaginal dryness, and leg joint discomfort.

Another study of postmenopausal women found similar results. Participants taking **500 mg** of **fenu-greek** extract daily (as **250 mg** twice daily) for 42 days experienced:¹

- A **46.2%** decrease in **Menopause Rating Scale** scores assessing the severity of menopause symptoms,
- Reductions in **psychological** symptoms (mood swings, anxiety, and depression), **sensory** symptoms (hot flashes and night sweats), and **physical** symptoms (joint pain and sleep disturbances), and
- A remarkable **39.8%** increase in **estradiol** (active estrogen) levels and **21.2%** increase in progesterone levels.

Overall, **76%** of the **fenu-greek** extract group reported a substantial improvement within just two weeks of supplementation.

Along with the potential long-term health benefits of raising estrogen levels, reducing menopause symptoms can vastly improve the lives of women in their 40s, 50s, and beyond.

Summary

As women go through perimenopause and menopause, declines in levels of **estrogen** lead to an array of **menopausal symptoms**.

Clinical trials show that taking a standardized **fenu-greek seed extract** safely restores a healthy **hormone balance** and significantly reduces those symptoms, including hot flashes, night sweats, depression, sleep issues, vaginal dryness, and joint discomfort. •

If you have any questions on the scientific content of this article, please call a **Life Extension** Wellness Specialist at 1-866-864-3027.

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Aging can Wait



Support for a Healthy Lifespan



Item #02527

7.41 oz.

1 jar \$27

4 jars \$25.50 each

The full dose is one scoop daily mixed with water or juice.



Contains wheat.

For full product description and to order **Healthy Aging Powder**, call **1-800-544-4440** or visit **www.LifeExtension.com**

In recent years, three nutrients have emerged as having healthy **lifespan-enhancing** potential:

Taurine

Functions via a range of *anti-aging* mechanisms¹⁻⁵

Lithium

In epidemiological studies higher dietary intake of lithium (drinking water) is associated with lower risk of mortality.⁶⁻⁸

Spermidine

In epidemiological studies, higher intake correlates with longer healthspan.⁹⁻¹¹ A one-year study showed that a diet enhanced with **spermidine** daily *improved* memory scores.¹²

Consumers have used some of these **nutrients** for decades, albeit at lower concentrations than what may be optimal for healthy aging.

New Healthy Aging Powder provides the following in one scoop:

- **Taurine** 5,000 mg
- **Lithium** 2,000 mcg
- **Spermidine** 3,000 mcg
(0.2% standardization from 1,500 mg Wheat germ extract)

These nutrients may promote **healthy aging** by supporting cardiovascular health, exercise performance, and cognitive function.

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Munch

Crunch Digest Your Lunch
(Or breakfast, or dinner...)

Uncomfortable after eating?

Digestive enzymes are specialized proteins that help you break down the foods you eat.

Enhanced Super Digestive Enzymes combines 10 vegetarian-friendly enzymes to help you break down hard-to-digest foods and encourage a healthy gastrointestinal balance...so you can feel good after you eat!



Item #02021 • 60 vegetarian capsules

1 bottle **\$16.50** • 2 bottles \$15.75 each



For full product description and to order **Enhanced Super Digestive Enzymes**, call **1-800-544-4440** or visit www.LifeExtension.com

Contains wheat, soybeans.

"This product is very good,
and I will continue with it."

Eric

VERIFIED CUSTOMER REVIEW

**Combat
Unsightly
Veins**

Discover a European Secret for Beautiful Legs

Youthful Legs helps your legs look and feel great by:¹⁻⁴

- Supporting healthy blood flow.
- Maintaining healthy venous tone and elasticity.
- Safeguarding collagen suppleness.



Item #02252
60 softgels

1 bottle **\$16.50**
4 bottles \$15 each

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For full product description and to order **Youthful Legs**,
call **1-800-544-4440** or visit **www.LifeExtension.com**

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Make Your Tummy



SMILE

"I have taken this supplement for a long time. It works!"

Ingrid

VERIFIED CUSTOMER REVIEW

PHAGES + PROBIOTICS REBALANCE YOUR DIGESTION

Phages target bad intestinal bacteria, allowing beneficial strains to flourish.

FLORASSIST® GI provides a 7-strain blend of **probiotics** in a **dual encapsulation** formula to deliver beneficial bacteria and **phages** where you need them the most.



Dual-Encapsulation Delivery



Item #02125

30 liquid vegetarian capsules

1 bottle **\$24.75**

4 bottles **\$22.50 each**

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For full product description and to order **FLORASSIST® GI with Phage Technology**, call **1-800-544-4440** or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

hormone harmony

Estrogen Balance Elite contains a proprietary seed extract of the herb **fenugreek** to promote healthy hormonal balance.

In clinical studies, fenugreek seed extract has been shown to provide relief for **menopause discomforts**, including:*

- ✓ Hot flashes
- ✓ Night sweats
- ✓ Mood
- ✓ Sleep disturbances
- ✓ Vaginal dryness
- ✓ Leg joint and muscle discomfort

This **plant-based** product also includes **Red Clover**, **Chaste Tree**, and **Black Cohosh** for women's health during menopause.

Item #02534 • 60 vegetarian tablets

1 bottle \$15.75 • 4 bottles \$14.25 each

This product does NOT contain estrogen.

CAUTION: Consult with your healthcare practitioner if you have, or have a history of, estrogen-dependent tumors.

* PharmaNutrition 2020;14:100209.



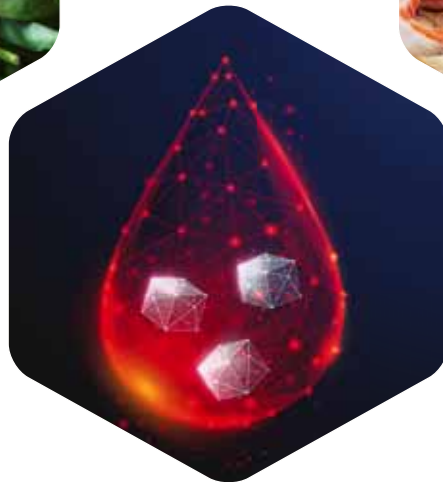
For full product description and to order **Estrogen Balance Elite**, call **1-800-544-4440** or visit **www.LifeExtension.com**

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.



VITAMIN K's Role in Blood Sugar Control





BY JULIA REMINGTON

Vitamin K is best known for promoting proper blood clotting and bone health.¹

A meta-analysis of randomized controlled trials revealed that **vitamin K** supplementation also has favorable effects on **glucose metabolism** parameters and risk of developing **type II diabetes**.²

In observational studies, higher intake of vitamin K has been associated with a reduced risk of type II diabetes and improved markers of glucose control.³⁻⁵

Clinical trials have shown that vitamin K supplements can improve metabolic health in adults with diabetes and prediabetes, significantly reducing elevated **glucose** and **insulin** levels.⁶⁻⁸

That may help prevent the damage caused by high blood sugar in diabetics *and* reduce the risk of developing **type II diabetes** in the first place.

The Importance of Vitamin K

Vitamin K is found in green leafy vegetables, fermented foods, and some animal products, particularly organ meats. It occurs in two general forms, **vitamin K1** and **vitamin K2** (see box on page 44).¹

Vitamin K is *required* for the proper function and activation of different proteins known as **vitamin K-dependent** proteins.

These proteins include several **clotting factors** that control blood coagulation as well as **osteocalcin**, a protein tied to vascular and bone health.

Some of these vitamin K-dependent **proteins** help keep **calcium** in the **bones**, and out of **blood vessels**. Calcified blood vessels are one of the hallmarks of atherosclerosis and vascular dysfunction. Without adequate vitamin K, the risk of cardiovascular disease, osteoporosis, and osteopenia rises.^{1,9}

Other vitamin K-dependent **proteins** have favorable effects on **metabolic function**.^{3,10}

Link to Metabolic Health

Multiple types of research indicate that vitamin K2 intake may lower risk of developing **type II diabetes**.¹¹

The vitamin's role in glucose homeostasis may be due in part to the activation of **osteocalcin**. In addition to its role in **bone** mineralization, osteocalcin stimulates healthy insulin and adiponectin expression.¹²

Studies show that people with *higher* intake of vitamin K tend to have *better* insulin sensitivity, better control of **blood glucose** levels, and a *decreased* risk of developing **type II diabetes**.^{3,5}

In an observational study embedded in a randomized controlled trial of the Mediterranean diet for prevention of cardiovascular disease, men and women without cardiovascular disease were followed for 5.5 years. Dietary information was collected annually through questionnaires.

It was found that baseline intake of **vitamin K1** was lower in participants who developed diabetes during the study. It was also found that the risk of developing diabetes dropped by approximately **17%** for every **100 mcg** of vitamin K1 consumed per day.

Subjects who increased their dietary vitamin K1 intake over those 5.5 years had a **51% reduction in risk** for developing diabetes, compared with those who did not increase vitamin K intake. The authors concluded that dietary vitamin K1 is associated with reduced risk of type II diabetes.¹³

Impressive Clinical Results

Clinical trials have confirmed that **vitamin K** intake (either as vitamin **K1** or **K2**) can improve metabolic health in diabetic and nondiabetic adults.

Three randomized, controlled trials of the MK-7 form of vitamin K2 have shown clear benefits to **glucose** metabolism in adults with **type II diabetes**.^{6,7,14}

In all three trials, taking **90-360 mcg** of MK-7 vitamin K2 daily for three to six months significantly *reduced* fasting **blood glucose** and **hemoglobin A1c** (HbA1c), a marker of long-term glucose control, compared to **placebo**.

In one of these trials, published in **2023**, adults with type II diabetes who took vitamin K2 at **90 mcg** per day for six months *reduced* fasting **glucose** by **13.4%**, fasting **insulin** by **28.3%**, and HbA1c by **7.4%**.¹⁴ High fasting insulin is often seen in early-to-mid-stage type II diabetics and can be a significant risk factor for metabolic dysfunction and diabetic complications.¹⁵

In another of these trials, a measure of **insulin resistance** was reduced by **55%** in the group receiving **200 mcg** per day of the MK-7 form of vitamin K2.⁶

Vitamin K has also been shown to lead to metabolic improvements in healthy adults and those with **prediabetes**.




 WHAT YOU NEED TO KNOW

Improve Metabolic Health

- **Vitamin K** has long been recognized for its importance to blood clotting and bone health. It has now been shown to also play a role in metabolic health.
- In observational studies, lower levels of vitamin K correlate with greater risk for insulin resistance and **type II diabetes**. *Higher* blood levels of vitamin K are linked to a *decreased* risk of diabetes.
- Clinical trials show that vitamin K intake improves metabolic health, increasing insulin sensitivity and **reducing blood glucose** levels in those with diabetes and prediabetes. It also reduces the risk of developing type II diabetes.

Two placebo-controlled randomized trials showed that vitamin K can improve insulin sensitivity. One study showed that vitamin **K1** benefitted older men, compared to placebo¹⁶ while the other found a similar effect in young men, using the MK-4 form of vitamin **K2**.¹⁷

In another randomized controlled clinical trial, **pre-diabetic** women were given **1,000 mcg** of vitamin **K1** or a placebo daily for four weeks. Vitamin K1 lowered **blood sugar** and increased **insulin sensitivity**.⁸

How It Works

Vitamin K appears to improve insulin function and glucose metabolism in at least two main ways:

- Activating vitamin K-dependent proteins is involved in regulating **glucose metabolism**.³
- Suppressing chronic **inflammation** and production of pro-inflammatory compounds. These are major contributors to diminished insulin sensitivity and metabolic disease.³

Together, these actions could help reduce elevated glycemic markers and lower risk for diabetic complications.

Summary

Low levels of **vitamin K** are tied to increased risk for insulin resistance, poor glycemic control, and **type II diabetes**.

In observational studies, *higher* vitamin K intake and blood levels are associated with *lower* risk of diabetes.

Clinical trials show that vitamin K intake improves **metabolic health** and lowers elevated **blood glucose** in those with both type II diabetes and prediabetes. It can also help reduce the risk of developing type II diabetes. ●

The Difference Between Vitamin K1 and K2

Vitamin K is generally taken in two different forms.

Vitamin K1 (also known as **phylloquinone**) is found mostly in leafy green vegetables. It is necessary for normal, healthy blood clotting.^{3,18}

Vitamin K2 (**menaquinone**) is found in some fermented foods, dairy products, and organ meats.^{3,18}

The biological effects of vitamin K1 and K2 are overlapping, though each works in somewhat different ways and may be absorbed and used differently by the body.¹⁹

Optimal intake of **both** forms is recommended to ensure you are maximizing their potential benefits.

If you have any questions on the scientific content of this article, please call a **Life Extension Wellness Specialist** at 1-866-864-3027.

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Promote immune, brain and bone health with vitamin D3, a whole-body health supporter. A daily dose of D3 also supports your heart and vascular health and helps you maintain those healthy blood pressure levels.

Item #01713 • 125 mcg (5000 IU) • 60 softgels

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Caution: Individuals consuming more than 50 mcg (2000 IU)/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxy vitamin D measurement. Do not exceed 10000 IU per day unless recommended by your doctor. Vitamin D supplementation is not recommended for individuals with high blood calcium levels.

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Maintain Optimal Hormone Levels

7-Keto® is a metabolite of **DHEA** ideal for weight management.

Maintaining youthful **DHEA** levels can help support immune function, circulatory health, mood, libido, and more.

DHEA Complete delivers **7-Keto®** **DHEA (100 mg)** and regular **DHEA (25 mg)**, plus extracts from curcumin, green tea, and whole red grapes.



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60 vegetarian capsules

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4 bottles \$32 each



This supplement should be taken in conjunction with a healthy diet and regular exercise program. Individual results may vary and are not guaranteed.

CAUTION: Consult a physician or licensed qualified health care professional before using this product if you have, or have a family history of breast cancer, prostate cancer, or other hormone-sensitive diseases.

7-Keto® is a Lonza trademark registered in USA.

For full product description and to order **DHEA Complete**, call **1-800-544-4440** or visit www.LifeExtension.com

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If you experience general fatigue, it may be due to the decline of NAD⁺, an important coenzyme found in every cell.

NAD⁺ facilitates the production of ATP, which your body uses for fuel.

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Nicotinamide riboside (300 mg), bioavailable resveratrol and other cell-energizing nutrients in one capsule.

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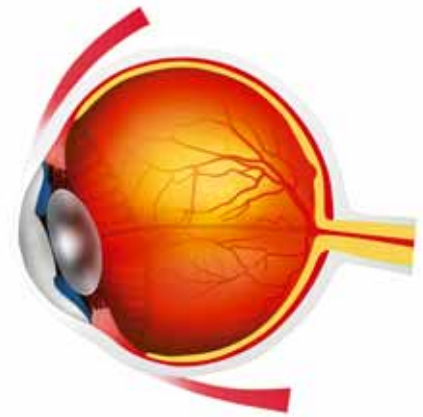
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For full product description and to order **Eye Pressure Support with Mirtogenol®** call **1-800-544-4440** or visit **www.LifeExtension.com**

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30 vegetarian capsules

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4 bottles **\$26.50 each**

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SUPER

K



A Healthy Kick for Your Heart & Bones

Just one daily softgel of Super K provides:

Vitamin K1	1,500 mcg
Vitamin K2 (MK-4)	1,000 mcg
Vitamin K2 (trans MK-7)	100 mcg

CAUTION: If you are taking a vitamin K antagonist (e.g. warfarin), consult your healthcare practitioner before taking a vitamin K supplement.

Item #02334
90 softgels
1 bottle \$22.50
4 bottles \$20.25 each

Each bottle lasts for three months.



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For full product description and to order Super K, call 1-800-544-4440 or visit www.LifeExtension.com

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Adverse Impact of Early-Onset **MENOPAUSE** or Symptom Severity

BY WILLIAM FALOON

The average age of menopause in the United States is **51 years**.

Premature menopause describes a woman who enters **menopause** under age **40**.

Early-onset menopause is typically diagnosed when women enter menopause at age **40-45 years**.

Late-onset menopause occurs when women enter menopause after **55 years** of age.

A menopausal woman is no longer ovulating, her sex hormone levels have plummeted, and she may struggle for years with menopausal miseries such as sleep deprivation, memory loss, and unwanted weight gain.

Over the decades, we've published many articles about how maturing women can offset the miseries and health risks inflicted by **menopause**.

We were among the first to identify the potential cancer and cardiovascular risks posed by some types of oral **synthetic progestogens** (also called *progestins*) that were often combined with various forms of **conjugated equine estrogen** (i.e., estrogen derived from horses).

A potentially better option for most women and their treating physicians contemplating hormone replacement therapy is the use of transdermal bioidentical **estrogen** and oral micro-nized **progesterone** that are available at most pharmacies today.

Dangers of Severe Menopause Symptoms

In a huge observational cohort of around 80,000 postmenopausal women from the famous **Women's Health Initiative** study, the **severity of menopausal symptoms** correlated with increased risk of **cardiovascular disease** and shorter **lifespans**.¹

The women in this study had no known cardiovascular disease at baseline.

The severity and medical outcomes were assessed during a median of **8.2 years** of follow-up.

Greater **cardiovascular disease** risk was observed with increased **severity** of the following **menopausal symptoms**:

- night sweats,
- waking up several times at night,
- joint pain or stiffness,
- heart racing or skipping beats,
- dizziness,
- feeling tired,
- forgetfulness,
- mood swings,
- being restless or fidgety, and
- difficulty concentrating.

Each of these **menopausal miseries** was significantly associated with **cardiovascular disease** events.

The largest risk was for “*moderate or severe heart racing or skipping beats.*” This **menopausal** symptom increased **cardiovascular** events by **55%**.

Increased **all-cause mortality** was associated with individual **severities** of:

- heart racing or skipping beats,
- dizziness,
- tremors,
- feeling tired,
- forgetfulness,
- mood swings,
- being restless or fidgety, and
- difficulty concentrating.

These data sets garnered some publicity in **2023**, but little has been done to improve **standard of care** as it relates to use of more preventative cardiovascular interventions in women with a history of severe **menopausal symptoms**.

Alleviating **severe** symptoms with replacing the hormones (estrogen, progesterone, others) lost to **menopause** might reduce the adverse health outcomes.

Hormone Balance



Dangers of Early Menopause

Data from 12 independent studies were extracted to assess if the length of **reproductive lifespan** is associated with future risk of **cardiovascular disease**.²

Reproductive lifespan can be defined as the years between the age of first menstrual bleeding (menarche) to the onset of **menopause** (or perimenopause in some cases).

This pooled analysis consisted of over 307,000 participants and found that women with short reproductive lifespan (under 30 years) were at a **71% higher** risk of **heart attack, stroke**, or nonfatal **coronary** event compared to those with *longer* reproductive lifespans of 36-38 years.

Said differently, a female who enters **menarche** at **age 10** and menopause at **age 40** has a short reproductive lifespan (30 years) and in this study, greater cardiovascular disease hazards.



Younger age at menarche remained a significant uncontrolled factor, but **delayed menopause** was found to reduce **cardiovascular** risks.

Health Consequences of Premature Menopause

A data review from the **Mayo Clinic Cohort Study of Oophorectomy and Aging** further identified the adverse impact of **premature menopause**, be it naturally occurring or caused by a medical procedure.³

The researchers found that women who experience **premature menopause** (before age 40 years) or early-onset menopause (between ages 40 and 45 years) experience increased risks of:

- overall mortality,
- cardiovascular diseases,
- psychiatric disorders,
- osteoporosis, and
- other health issues.

The researchers found the risk of adverse health outcomes increases with *earlier* age of **menopause onset**.

These researchers noted that some of the adverse outcomes may be prevented by **estrogen treatment** initiated after the onset of menopause. They cautioned that estrogen alone does not prevent all long-term consequences and other hormonal mechanisms are likely involved.

The authors of this study concluded:³

“... women who experience hormonal menopause and estrogen deficiency before reaching the median age of natural menopause are at increased risk for morbidity and mortality.”

Early Menopause Associated with Type II Diabetes and Reduced Life Expectancy

Researchers conducted a population-based prospective cohort study of 3,650 postmenopausal women over age 45 years to compare the association of age of natural **menopause onset** with total **life expectancy** and the number of years alive with and without **type II diabetes**.⁴

The study found that women with *early-onset menopause* (defined as under 44 years old) have a shorter overall **life expectancy** and are at increased risk of developing **type II diabetes** earlier in life.

Compared with *late-onset* menopause (defined as ≥ 55 years old), *early-onset* menopause was associated with a **42%** increased risk of death in women without diabetes.

Women with **type II diabetes** and **early-onset menopause** were at a **64%** associated increased risk of **death** compared with those with *late*-onset menopause. This high mortality rate was not found in women who undergo menopause at typical ages.

These researchers found that **total life expectancy** at age 50 years was shorter in women who had *early* menopause and significantly longer in those with *late* menopause.

Early Menopause = Heart Attack and Early Death

A study conducted in The Netherlands found that women who enter menopause before **age 45** are more likely to have **cardiovascular** problems and to **die younger** than women who enter menopause later in life.⁵

Comparing women who had their last period before age 45 to those who entered menopause at age 45 or older, women with **earlier menopause** had a **50% higher** risk of **coronary heart disease**.

Women who entered menopause before **age 45** were about **20% more** likely to die from cardiovascular disease (including heart attack and stroke) than women with later-onset menopause.

Women who entered menopause *early* were also **12% more** likely to die of any cause.

These European findings corroborate other studies described in this article showing that **age** at **menopause** may help predict women's risk for future health issues. In an interview, the lead researcher stated:⁶

“Our results indicate that menopause might be a critical period to evaluate women's risk for future cardiovascular events and that it may be an appropriate time to introduce interventions to reduce the risk... Women who enter menopause early may want to work on controlling their blood pressure, cholesterol, blood sugar and other factors affecting their heart health.”

Estrogen-Progesterone Replacement Options

The data conveyed in this editorial should alter medical practice in ways that encourage recognition of **early-menopause** onset or **severe menopausal symptoms** as indicators of increased disease risk.

Compared to prior decades when **synthetic progestogens** and **conjugated equine estrogens** in oral form were widely used, women have many options including

transdermal application of bioidentical **estrogen** and **progesterone** drugs prescribed by a physician.

Page 30 describes a **plant-derived** estrogen that boosted estradiol blood levels and reduced **menopausal** symptoms in a placebo-controlled **clinical trial**. ●

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Risks of Early Menopause from Hysterectomy

Studies show that women age faster if they have a hysterectomy (surgical removal of uterus) before menopause.

A hysterectomy, especially when it involves removal of both ovaries, can lead to immediate menopause, known as surgical menopause. Regardless of a woman's age, this abrupt loss of hormones, primarily estrogen, can accelerate menopause and natural aging. Sudden cessation of menstruation and a lack of estrogen will cause symptoms of menopause including hot flashes, vaginal dryness, and night sweats.^{7,8}

Potential Impacts of Early Hysterectomy on Aging

Bone Density Loss: Estrogen is crucial to bone health. Typical menopause leads to bone loss and ultimately osteoporosis. The sudden drop in estrogen levels after a hysterectomy, especially if the ovaries are removed, can lead to faster bone density loss (osteopenia) and ultimately osteoporosis, similar to typical menopause but at an earlier age.⁹

Cardiovascular Health: Estrogen has protective effects against heart disease. Women who undergo early menopause, whether due to surgery or naturally occurring, are at a higher risk of developing cardiovascular diseases (including heart attack and stroke) sooner than those who experience menopause at the typical age.^{5,9,10}

Psychological Effects: Early menopause can also have psychological effects, such as increased risks of depression and anxiety, which can affect overall well-being and perceived quality of life.^{9,12}

Skin and Tissue Health: Estrogen affects skin health and the integrity of connective tissues. Early reduction in estrogen levels could lead to signs of skin aging and changes in tissue health.¹³

Mitigation Strategies

Women may undergo a hysterectomy for a variety of reasons including fibroids, endometriosis, and ovarian cysts. Young women are often recommended hormone replacement therapy (HRT), at least until they begin menopause.

Hormone replacement therapy can reduce some of the rapid changes associated with surgical menopause, helping to manage symptoms and potentially reduce the risks of osteoporosis and cardiovascular disease.⁷

Each woman's experience of these symptoms is different and is based on her health, age and treatment plan. It's important for women who have undergone early hysterectomy to have a management plan that includes monitoring, and preventing or potentially treating these risks in consultation with their healthcare provider.

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Effects of Lycopene on Insulin Function

BY JASON ALLEN



Insulin resistance is at the root of most glucose control disorders like **type II diabetes** and **metabolic syndrome**.

With normal function, the body's insulin system helps process **blood glucose**, keeping levels in check. If insulin resistance develops, blood sugar levels can soar, eventually causing widespread damage.¹

A review and meta-analysis of randomized **clinical trials** found that individuals supplemented with **lycopene** tended to have **lower** levels of fasting blood **glucose**. This was true in studies in diabetics and non-diabetics, including those with metabolic abnormalities.²

An earlier comprehensive review of **human** studies noted better **metabolic health** in those who consume more **lycopene**.³

Insulin Resistance

Insulin is a hormone produced by the pancreas. It instructs cells to take up and use glucose.

After a meal, **blood glucose** levels rise. Insulin helps cells process this glucose, bringing glucose levels down again.⁴

When sensitivity to insulin *drops*, which is more common with advancing age and abdominal obesity, it is known as **insulin resistance**. This happens because cells do not take up glucose efficiently and levels stay abnormally high.¹

Insulin resistance can lead to **type II diabetes** and can be related to accelerated aging. This includes development of disorders of the heart, brain, kidneys, nerves, and (fatty) liver.¹

The number of people with diabetes is rising and is expected to reach more than **half a billion** worldwide by 2030.⁵

Lycopene Improves Metabolic Health

Lycopene is a red **carotenoid** pigment found in tomatoes, watermelon, and other fruits. It has demonstrated antioxidant and anti-inflammatory activity and has been studied for its potential ability to fight factors that drive chronic disorders.⁶

In a large review of studies, researchers determined that **higher dietary lycopene** or higher serum lycopene was associated with **reduced** all-cause mortality,

prostate cancer, stroke, cardiovascular disease, metabolic syndrome, and male infertility.⁷

Several studies have suggested that some of lycopene's anti-aging benefits may be due to its ability to protect against metabolic disease and elevated blood glucose.^{2,8,9}

A systematic review of **human** studies has found an association between higher lycopene intake or blood levels and better **metabolic health**.

Similar results were seen in a subset of human intervention trials, showing protective effects of lycopene intake against metabolic syndrome using varying dosages and durations of intake.³

A review and meta-analysis of clinical studies found that those with higher **lycopene** intake tend to have **lower** levels of **fasting blood glucose** in both diabetics and non-diabetics.²

In two studies in people with diabetes, taking **30 mg** of lycopene daily reduced fasting blood glucose by almost **10%**.²

Improves Insulin Resistance

In the last couple of years, new research into lycopene's effect on insulin has been published.

Obese animals and aged animals normally suffer from **insulin resistance** and glucose intolerance. But lycopene intake *reversed* these metabolic abnormalities, improving **insulin sensitivity** and mitochondrial function, along with blood **glucose control**.¹⁰⁻¹⁴

Studies have also found that lycopene **reduced inflammation** in liver and fat tissues,^{10,15} lowering signs of tissue aging and improving the function of blood vessels, which normally deteriorate with **insulin resistance**.^{11,12}

Lycopene's ability to improve metabolism and counter insulin resistance is partly due to its **anti-inflammatory** and **antioxidant** effects.^{8,11,12}

Recent studies, however, suggest another way that lycopene may improve insulin function.





Lycopene activates an **anti-aging protein** in cells called **SIRT1**. Diminished activity of this **sirtuin** (a protein critical for cellular health) is part of the process that leads to insulin resistance.^{11,12} By **boosting SIRT1**, lycopene can fight aging while improving **insulin function**.

This suggests that augmenting **sirtuin** function is an additional mechanism that aids in lycopene's metabolic benefits.

Summary

Insulin resistance leads to high blood sugar and metabolic disorders, including **type II diabetes**.

Observational studies suggest that lycopene intake may help lower high blood sugar levels. Recent research shows that lycopene may restore **insulin sensitivity**, improve sirtuin function, and reduce chronic inflammation and oxidative stress. ●

If you have any questions on the scientific content of this article, please call a **Life Extension Wellness Specialist** at 1-866-864-3027.

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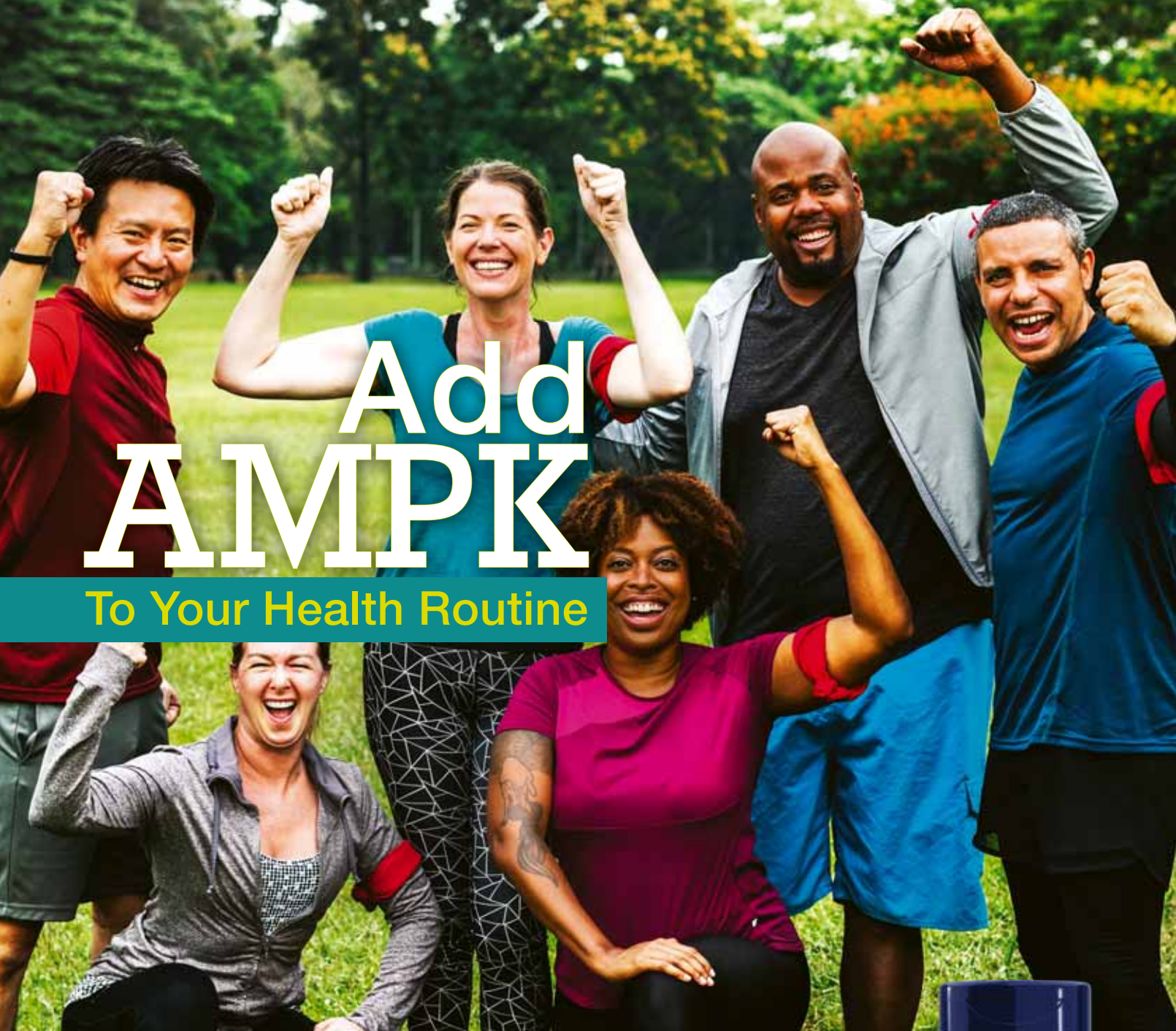
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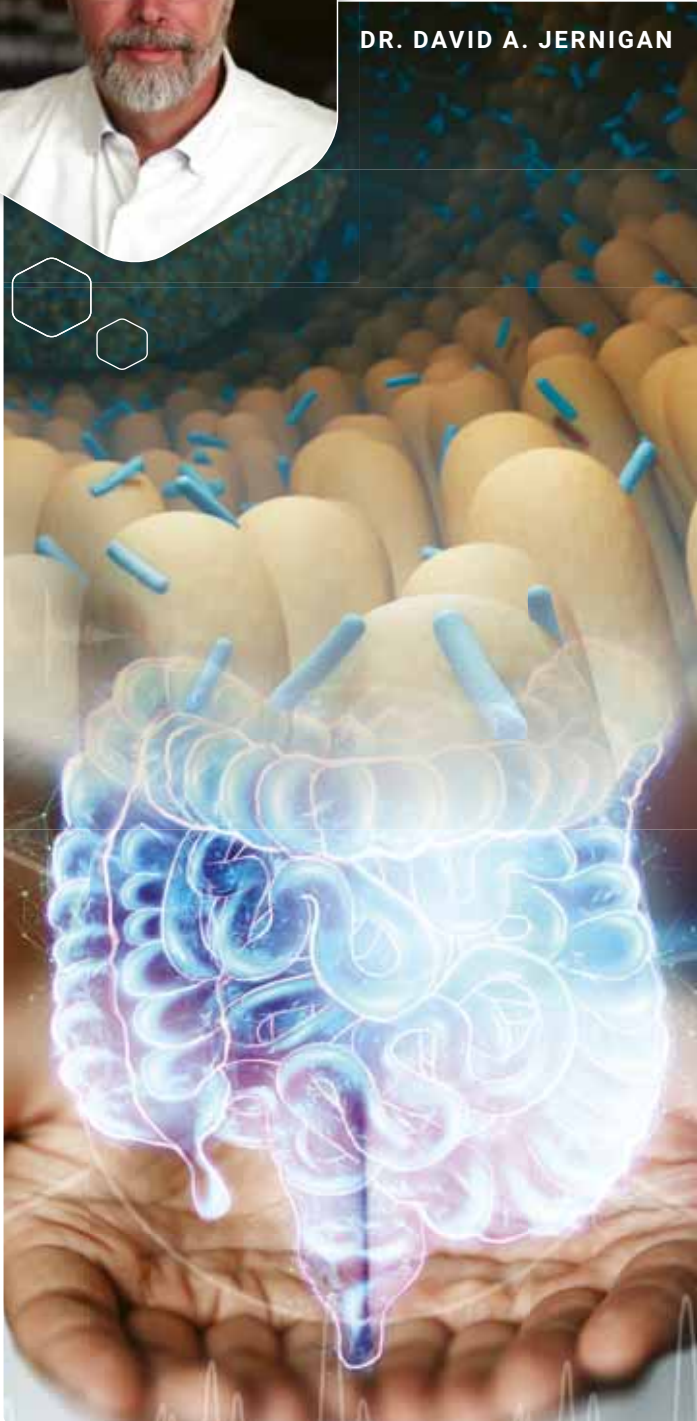
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New Innovations in Phage Therapy



DR. DAVID A. JERNIGAN



Readers of *Life Extension Magazine*® are familiar with the concept of **phages** or bacteriophages, which are packets of protein that destroy harmful bacteria, especially in the gut. When combined with **probiotics**, these phages can help restore a healthy digestive balance.

For many specialized conditions, targeted phage therapy can be therapeutic. This requires the intervention and guidance of a doctor. **Dr. David A. Jernigan**, founder and CEO of the **Biologix Center for Optimum Health** in Franklin, Tennessee, and a pioneer in phage therapy has developed an innovative treatment called **Induced Native Phage Therapy**. Unlike traditional phage therapy, Dr. Jernigan's method is proposed to stimulate the phages that already live in your body that target and kill various types of infection.

In this interview, **Dr. Jernigan** explains the history of phage therapy and how new breakthroughs are revolutionizing phage treatment.¹

Before antibiotics, infections were treated with **bacteriophages** found in the earth. Scientists discovered that they killed off bad bacteria, leaving the healthy bacteria intact. When pharmaceutical antibiotics were introduced, they were easy and cheaper than the laborious process of selecting the right phage for the condition, and they quickly replaced phage therapy. Now, with antibiotic resistance reaching epidemic levels, scientists are slowly rediscovering the powerful therapeutic benefits of this drug-free treatment.

LE: Can you explain what phage therapy is?

Dr. Jernigan: Bacteriophages, or **phages** for short, are beneficial viruses that only infect bacteria. The word bacteriophage literally means “*bacteria-eater*.”²

Bacteriophages were discovered in 1917 and have been in therapeutic use in isolated areas around the world ever since. Conventional **phage therapy** is when doctors use phages found in the environment to selectively reduce or kill specific harmful bacteria. Phage therapy often works better than advanced antibiotics, even with multi-drug-resistant infections.²

LE: Please describe the process of how bacteriophages are used in therapy.

Dr. Jernigan: In conventional phage therapy, bacteriophages are found in bacteria-rich environments, such as manure, soil, and sewage.



All bacteria in nature are already infected with their own unique type of bacteriophage. Scientists isolate and identify the type of phages and name them based upon the type of bacteria they use as a host, such as *E. coli*-phage for those found infecting *E. coli* bacteria. These bacteriophages are then stored in phage banks to be matched in a petri-dish to the type of infection from which a person is suffering. Once one or more phages are identified that should work to kill an infection, they are administered via a cocktail intravenously, via intramuscular injections, nasal sprays, or oral solutions.

LE: Is this the phage therapy you use?

Dr. Jernigan: No. In 2019, I invented a completely unique way to activate or induce specific beneficial phages *already living inside the body*. I named this **Induced Native Phage Therapy**.³ These phages are beneficial viruses that help your immune system keep the many populations of microbes in your body from growing out of control. Your readers might relate these beneficial viruses to the already widely recognized beneficial bacteria that help us regulate our body. These beneficial viruses (phages) do not ever infect human cells. They only infect other microbes.

Researchers have found over **32,000** different beneficial phage populations just in the healthy human gut, significantly more than the **300** or so conventional phages stored in most phage banks.

LE: Can you explain this therapy in greater detail? How are your phages delivered to the patient?

Dr. Jernigan: Instead of introducing phages into your body, as in conventional phage therapy, **Induced Native Phage Therapy** is an oral liquid solution that carries the complex signals to induce the aid of monovalent or polyvalent phages that already live in your body to target and kill just the type of infection your doctor is treating. When the phages are successful, the targeted bacterial population can be eliminated within 24-48 hours in recently acquired infections and within days to weeks in deep-seated infections.

Research shows that phages can even kill the bacteria inside cells and those hiding behind biofilms.

These formulations are packaged in individually sealed glass, sterile ampules, so there is no chemical agent or preservative in the formulation. The ampules come packaged with a tiny straw so you can break off the top of the ampule, insert the straw and sip out the individual dose, swish on the teeth and swallow. Most often doctors recommend taking one ampule twice a day in a naturally clean mouth.

The formulation only acts on the specific native phages that would naturally be able to infect the specific infection being targeted. These liquid formulations are called Inducen™ formulas, of which there are 14 different illness-specific products. Each Inducen™ formula contains induction signatures for all the typical microbes commonly associated with the illness. For instance, the Inducen-LD/RF formulation, which was formulated for people who have recent or treatment-resistant Lyme disease or Relapsing Fever illness, targets about 90 different types of microbes commonly seen in these illnesses, since there are often many co-infections and opportunistic infections

that take advantage of a person's weakened condition. This formulation has all of the many types of *Borrelia*, *Babesia*, *Bartonella* strains and many other types of commonly seen co-infections all in one formulation. In our research, with over **100,000** doses given to very sick and sensitive cases, we have had no reported adverse effects from these new Inducen™ remedies. However, maintaining a good detox program is still recommended to help the body with any heavy metals and other toxins released from the dead microbes.

LE: Are there side effects or risks to this phage therapy?

Dr. Jernigan: In over **100,000** doses given, there have been no reported adverse effects! Induced Native Phage Therapy is completely non-toxic and non-allergenic. We are *not* putting new phages into the patient, so there is no immune response against them. The signals contained in the oral supplement that activates the phages are essentially invisible to the immune system and regulatory aspects of the body.

LE: How did you get involved in researching phages?

Dr. Jernigan: For almost three decades, I specialized in treating people who were considered chronically ill or incurable. Seeing only the toughest cases forced me to innovate new ways of testing and treating.

Beyond my patients, my muse was my wife, who had been sick from birth. For all my efforts, I could not get her completely well. I began reading innumerable books and peer-reviewed science articles about



phages. I also developed a technology called **Biospectral Emission Sequence** testing, which enables a doctor to sequence electromagnetic signatures to determine where a problem is arising, what is causing it, and how to enable the body to fix it. I used this technology to develop a way to stimulate native phages to target and eliminate specific bacteria. **Induced Native Phage Therapy** turned my wife's life around and has done the same for many of my patients.

LE: How did you know this new phage therapy worked?

Dr. Jernigan: To be successful, the phages need to eliminate the targeted bacteria. To validate **Induced Native Phage Therapy**, I did a study using the **Phelix Borrelia-Phage test**, a phage-based bacterial lab testing, by R.E.D. Laboratories in Belgium.

This test has a high sensitivity for the *Borrelia* infections that cause Lyme disease or Relapsing Fever. The results were published in a peer-reviewed article in 2021. Induced Native Phage Therapy was able to wipe out 100% of *Borrelia* strains in 92% of patients.⁴

LE: What potential do you see for Induced Native Phage Therapy?

Dr. Jernigan: We have already gone way beyond targeting bacterial infections. We can target every type of microbe, including mold, yeast, mycobacteria, mycoplasma, parasites, and even viruses, since within the healthy human body there are bacteriophages, mycophages, and virophages. Induced Native Phage Therapy can address many infections at once and be used in the toughest multi-drug-resistant infections.

LE: What specific conditions do you treat with Induced Native Phage Therapy?

Dr. Jernigan: At the **Biologix Center**, we see virtually any illness no one else can figure out. Many patients have musculoskeletal or neuromuscular symptoms ranging from pain syndromes to metabolic issues. With our multi-disciplinary approach, we have developed programs of care that I call Synergy Healing. Synergy Healing is combining a wide range of synergistic treatments and therapies to address everything we can find that has gone wrong in a person’s body. From this treatment philosophy, illness by any name/diagnosis can have the best chance of being eliminated by the only thing that can ever heal you, your body.

We see many people with symptoms from a wide range of previously diagnosed named conditions, such as Lyme disease, thyroid issues, pain syndromes, heart and circulatory problems, and the list could go on forever. We are never intimidated by the fact that a person has already exhausted all medical and natural options, since most of the world in medicine is practicing from the same rule book. We get to win more cases because of our testing and treatment innovations and our treatment philosophy. The patient’s body is the carpenter. The remedies and treatments are the tools and information that the carpenter must use to do the repair and restoration. Even phage therapy is just a tool in the toolbox of the doctor. However, now the task of your health care team is to help the body heal the many areas that have been damaged by the infections...

only then will true, lasting health be achieved. I would recommend your readers go to my website and read the article, “Phages: Setting Healthy Expectations.”⁵

Every chronic illness has what I call **Multi-Microbial Activation Syndrome**. Many people like to think of an illness as being caused by one type of infection, but with Biospectral Emission Sequence testing we can see that there are many different microbes at the same time acting out in cases of chronic illness of any type.

LE: What’s a typical treatment like?

Dr. Jernigan: A typical program is **two weeks** of all-inclusive care. The patient is in the clinic for four to six hours every day seeing the doctor and doing therapies. After that, the patient is given customized formulas and supplements to continue healing at home, with virtual doctor consultations in case they need to return or if the doctor needs to modify what a person is taking. The goal is to get a person to where they don’t need to take anything to manage symptoms, since the causes of their illness are gone.

The Biologix Center will offer a \$500 discount off a two-week program of care and a \$750 discount off a three-week program of care exclusively for **Life Extension®** readers. To receive your discount, please mention **Life Extension Magazine®** as your discount code.

LE: Will Induced Native Phage Therapy be widely available to physicians?

Dr. Jernigan: Yes, there are already a dozen broad-spectrum but targeted phage formulations we call **Inducen Formulations**. The plan is to get these in the hands of healthcare professionals by the end of 2024. •

If you have any questions on the scientific content of this article, please call a **Life Extension Wellness Specialist** at 1-866-864-3027.

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David A. Jernigan, DNM, D.C., is the founder and CEO of the Biologix Center of Optimum Health, a healthcare center for patients with treatment-resistant chronic illness. He also founded PhagenCorp, LLC, which pioneered the use of native phages to treat infections.

For further information contact **BiologixCenter.com** or call **615-398-6196**.

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Essential Youth with L-Ergothioneine

L-ergothioneine is a nutrient derived from the amino acid histidine and found naturally in mushrooms.

L-ergothioneine may support healthy aging by:

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One daily capsule of **Essential Youth** provides **5 mg** of **L-ergothioneine**.

One daily capsule provides as much **L-ergothioneine** as up to 2 to 5 cups of white button mushrooms.^{4,5}



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Many of broccoli's benefits come from **sulforaphane**—a compound that is *activated* when the plant is cut or chewed.¹⁻³

Mature broccoli provides relatively little **sulforaphane precursor** compared to broccoli sprouts. Cooking further depletes the sulforaphane precursor.^{2,4}

Optimized Broccoli with Myrosinase improves conversion of the precursor into **sulforaphane**, and its absorption into the bloodstream.^{2,5,6}

Each capsule of this product contains:

- **Glucoraphanin**—a sulforaphane *precursor*—found in broccoli seed extract that is standardized to a high concentration of glucoraphanin.^{3,4}
- **Myrosinase**, an enzyme found in mustard seed that converts **glucoraphanin** to **sulforaphane**.²⁻⁶
- **Vitamin C**, a cofactor for the myrosinase enzyme for more efficient *enzymatic conversion*.⁷

For full product description and to order **Optimized Broccoli with Myrosinase**, call **1-800-544-4440** or visit **www.LifeExtension.com**

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Whey Protein

BY LAURIE MATHENA



The Benefits of Whey

Whey protein powder represents a simple, effective way to significantly boost protein intake.

Whey is made from the liquid part of milk that separates during cheese production. In addition to being a complete source of protein, whey also contains nutrients like branched-chain amino acids (BCAAs), immunoglobulins, and lactoferrin.

BCAAs are essential nutrients that reduce muscle breakdown and stimulate the building of protein in muscle.⁷

But more than preventing muscle loss, whey can increase muscle mass.

In one study, healthy women from 65-80 years old who took whey protein supplements and exercised experienced a higher increase in muscle mass than those who exercised without taking whey.⁸

In another study, giving whey to hospitalized elderly individuals improved their nutritional status and rehabilitation outcomes.⁹

When combined with benefits like inhibiting weight gain and helping prevent cardiovascular disease, it's clear that whey may help support healthy aging.

Here, we share four delicious smoothie recipes that include whey protein powder for a simple way to get more protein in your daily diet.

A scoop of whey protein can add about **17 grams** of protein or more to a smoothie.

Whey protein is often associated with athletes who want to boost muscle mass and performance.

In reality, whey is *especially* beneficial for seniors. Research has shown that whey reduces muscle wasting in the elderly, inhibits weight gain, may help prevent cardiovascular disease, and more.¹⁻³

Older adults require *more* protein per kilogram of body weight than when they were younger because bodies don't utilize protein as well with age.⁴ Unfortunately, as many as one-third of older adults don't consume enough protein.⁵

Lack of protein intake can contribute to loss of muscle mass, decreased bone mass, cognitive impairment, decreased immune function, poorer healing, and longer recuperation from illness.⁶

When reduced protein intake is combined with an increasingly sedentary lifestyle and the natural decline in muscle mass with age, this can set the stage for deteriorating muscles, frailty, loss of independence, slower recovery from illness, and more.

Chocolate Peanut Butter Bliss Smoothie

- 1 cup unsweetened almond milk (or any milk of choice)
- 1 scoop chocolate whey protein powder
- ½ frozen banana, cut into chunks
- 2 tablespoons almond butter
- ½ teaspoon vanilla extract
- 1 handful of ice cubes

Directions

1. Add all ingredients to blender.
2. Blend until smooth.
3. Serve immediately.



Pineapple Coconut Smoothie

- 1 cup unsweetened almond milk (or any milk of choice)
- 1 scoop vanilla whey protein powder
- 1 cup frozen pineapple
- ¼ cup unsweetened coconut flakes
- 1 handful of ice cubes

Directions

1. Add almond milk and coconut to blender and blend until the coconut is smooth.
2. Add remaining ingredients to blender.
3. Blend until smooth.
4. Serve immediately.





Green Machine Smoothie

- 1 cup unsweetened almond milk
- 1 scoop vanilla whey protein powder
- ½ frozen banana, cut into chunks
- 1 large handful spinach
- ¼ cup frozen avocado
- 1 handful of ice cubes

Directions

1. Add all ingredients to blender.
2. Blend until smooth.
3. Serve immediately.

Chocolate Strawberry Smoothie

- 1 cup unsweetened almond milk
- 1 scoop chocolate whey protein powder
- 1 cup frozen strawberries
- 1 tablespoon hemp hearts
- 1 handful of ice cubes

Directions

1. Add all ingredients to blender.
2. Blend until smooth.
3. Serve immediately.

Create Your Own Smoothie

Customize your own smoothie by choosing from the following:

1. **Liquid**, such as almond milk, coconut milk, water
2. **Protein**, such as whey protein powder, yogurt, or chickpeas
3. **Healthy fat**, such as any nut butter, chia seeds, flax seeds, hemp hearts, or avocado
4. **Fruit**, 1 cup of any frozen fruit
5. **Veggies**, such as spinach or kale
6. **Flavor booster**, such as cinnamon, ginger, coconut, or vanilla extract
7. **Ice**

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- 01083 Melatonin • 500 mcg, 200 veg capsules
- 00329 Melatonin • 1 mg, 60 capsules
- 00330 Melatonin • 3 mg, 60 veg capsules
- 00331 Melatonin • 10 mg, 60 veg capsules
- 00332 Melatonin • 3 mg, 60 veg lozenges
- 02201 Melatonin IR/XR
- 01787 Melatonin 6 Hour Timed Release
300 mcg, 100 veg tablets
- 01788 Melatonin 6 Hour Timed Release
750 mcg, 60 veg tablets
- 01786 Melatonin 6 Hour Timed Release
3 mg, 60 veg tabs
- 01721 Optimized Tryptophan Plus
- 01445 Quiet Sleep Melatonin • 5 mg, 60 veg capsules
- 02502 Rest & Renew
- 02526 Serene Sleep

VITAMINS

- 01533 Ascorbyl Palmitate
- 00920 Benfotiamine with Thiamine
- 01945 BioActive Complete B-Complex
- 00102 Biotin
- 00084 Buffered Vitamin C Powder
- 02229 Fast-C® and Bio-Quercetin®
- 02075 Gamma E Mixed Tocopherol Enhanced with
Sesame Lignans
- 02070 Gamma E Mixed Tocopherol & Tocotrienols
- 01913 High Potency Optimized Folate
- 01674 Inositol Caps
- 02244 Liquid Vitamin D3 • 50 mcg (2000 IU)
- 02232 Liquid Vitamin D3 (Mint) • 50 mcg (2000 IU)
- 01936 Low-Dose Vitamin K2
- 00373 No Flush Niacin
- 01939 Optimized Folate (L-Methylfolate)
- 01217 Pyridoxal 5'-Phosphate Caps
- 01400 Super Absorbable Tocotrienols
- 02334 Super K
- 01863 Super Vitamin E
- 02422 Vegan Vitamin D3
- 02028 Vitamin B5 (Pantothenic Acid)
- 01535 Vitamin B6
- 00361 Vitamin B12 Methylcobalamin
- 01536 Vitamin B12 Methylcobalamin
1 mg, 60 veg lozenges
- 01537 Vitamin B12 Methylcobalamin
5 mg, 60 veg lozenges
- 02228 Vitamin C and Bio-Quercetin®
60 veg tablets
- 02227 Vitamin C and Bio-Quercetin®
250 veg tablets
- 01753 Vitamin D3 • 25 mcg (1000 IU), 90 softgels
- 01751 Vitamin D3 • 25 mcg (1000 IU), 250 softgels
- 01713 Vitamin D3 • 125 mcg (5000 IU), 60 softgels
- 01718 Vitamin D3 • 175 mcg (7000 IU), 60 softgels
- 01758 Vitamin D3 with Sea-Iodine™
- 02040 Vitamins D and K with Sea-Iodine™

WEIGHT MANAGEMENT & BODY COMPOSITION

- 02479 7-Keto® DHEA Metabolite
100 mg, 60 veg capsules
- 02207 AMPK Metabolic Activator
- 02504 Body Trim and Appetite Control
- 02478 DHEA Complete
- 01432 Optimized Saffron
- 02511 Thermo Weight Control
- 02509 Waistline Control™

WOMEN'S HEALTH

- 01942 Breast Health Formula
- 02534 Estrogen Balance Elite
- 01894 Estrogen for Women
- 02204 Menopause Relief
- 02319 Prenatal Advantage
- 01649 Soy Isoflavones
- 02513 Women's Bladder Support

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and
easy to take."

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VERIFIED
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Immune Function
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Whey Concentrate



Whey Isolate



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Whey protein provides vital amino acids and promotes **glutathione** synthesis.^{1,2}

Glutathione plays an important role in supporting **immune** balance in the body.^{1,2}

Whey fractions help modulate a full range of healthy bodily functions.¹⁻⁵

References

1. *J Food Sci Technol*. 2015 Nov;52(11):6847-58.
2. *Nutrients*. 2019 Sep 3;11(9).
3. *Aging Dis*. 2018 Feb;9(1):119-32.
4. *Aging Dis*. 2019 Feb;10(1):157-73.
5. *J Food Sci*. 2015 Mar;80 Suppl 1:A8-a15.

For full product description and to order **Wellness Code® Whey Protein Concentrate, Whey Protein Isolate, or Advanced Whey Protein Isolate with Glutamine and Creatine**, call 1-800-544-4440 or visit www.LifeExtension.com

Contains milk. Use these products as a food supplement only. Do not use for weight reduction.

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200 mg CoQ10

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